

CORRECTED VERSION

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
12 May 2005 (12.05.2005)

PCT

(10) International Publication Number  
**WO 2005/041726 A1**

(51) International Patent Classification<sup>7</sup>: **A47F 5/12**

(21) International Application Number:  
PCT/US2004/036098

(22) International Filing Date: 29 October 2004 (29.10.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
10/699,396 30 October 2003 (30.10.2003) US

(71) Applicant: **ROCK-TENN COMPANY** [US/US]; 504  
Thrasher Street, Norcross, GA 30071 (US).

(72) Inventor: **METCALF, Derek**; 51 Shore Drive, Burr  
Ridge, IL 60527 (US).

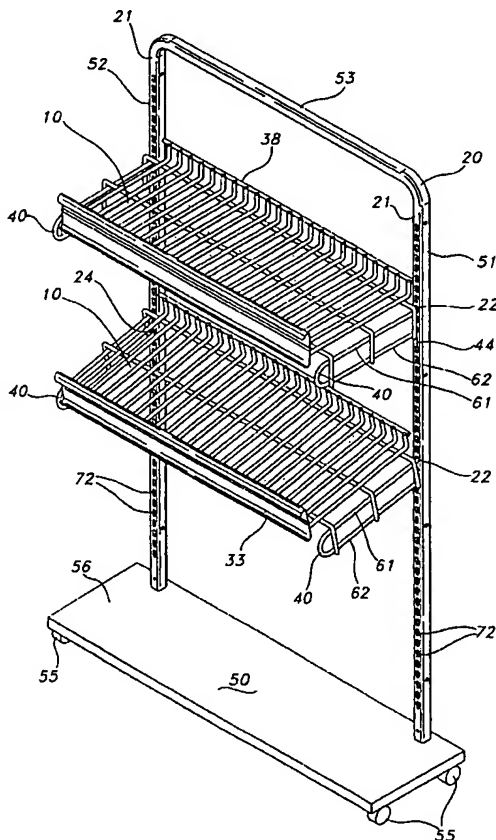
(74) Agent: **PRATT, John, S.**; Kilpatrick Stockton LLP, Suite  
2800, 1100 Peachtree Street, Atlanta, GA 30309-4530  
(US).

(81) Designated States (*unless otherwise indicated, for every  
kind of national protection available*): AE, AG, AL, AM,  
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,  
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,  
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,  
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,  
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,  
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,  
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,  
ZW.

(84) Designated States (*unless otherwise indicated, for every  
kind of regional protection available*): ARIPO (BW, GH,  
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,

[Continued on next page]

(54) Title: **ADJUSTABLE CANTILEVERED SHELF**



(57) Abstract: An adjustable shelf assembly for displaying product. The shelves can be oriented in horizontally or in a forward sloping position with a simple adjustment. The shelves are generally rectangular and comprise upper and lower mounting pins located on each side of the shelf, extending downwardly from the rear edge of the shelf. The mounting pins are vertically spaced and slightly offset from one another. The mounting pins are used to mount the shelf on a support frame comprising a plurality of openings along the vertical members of the frame. The upper mounting pins are placed in first openings along the frame. The lower mounting pins are positionable either flush against the front surface of the vertical members to position the shelf in a horizontal orientation or inside second openings along the frame to position the shelf in a forward sloping orientation.

WO 2005/041726 A1



ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),  
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,  
FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI,  
SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,  
GW, ML, MR, NE, SN, TD, TG).

**Published:**

— with international search report

(48) Date of publication of this corrected version:

18 August 2005

(15) Information about Correction:

see PCT Gazette No. 33/2005 of 18 August 2005, Section II

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

## ADJUSTABLE CANTILEVERED SHELF

5

### CROSS-REFERENCE TO RELATED APPLICATION

This application claims priority to U.S. Patent Application Serial No. 10/699,396 entitled "Adjustable Cantilevered Shelf" filed on October 30, 2003, the contents of which are incorporated herein by reference.

10

### FIELD OF THE INVENTION

The invention relates to adjustable display units for displaying products at retail establishments and, more particularly, to a display shelf adjustable between a horizontal display position and a forward sloping display position.

15

### BACKGROUND

Cantilevered display shelves are a popular and convenient way to display merchandise in a retail store environment. Typically, a vertical set of supports allows the shelves to be selectively positioned in a variety of heights and spacings.

20

Retailers may prefer to display different types of products in different orientations. Some products, for example, appear more enticing and are better displayed on a forward sloping shelf so that a perspective view of the product is available to the customer. Other products may preferably be displayed on a flat horizontal shelf due to varying marketing strategies or logistical requirements, for example due to product packaging configuration. Therefore, having an adjustable shelf would allow a retailer to accommodate both display styles with a single shelving unit. An adjustable shelf unit would also permit retailers to use the shelf unit in different configurations at different times to best suit the product being displayed.

25

Many existing adjustable display shelves involve complex or intricate structures to allow the adjustment of the display shelf, including numerous parts. Such designs make the adjustable shelves more difficult to produce and use. For example, special tooling may be required to manufacture the adjustable shelf, and  
5 if the manufacturer desires to change the slope angle of the shelf, the tooling may need to be readjusted. These tooling and design considerations add to the expense of such adjustable shelving units.

Existing adjustable shelf units may be difficult to use. A retailer desiring to switch a display shelf from a horizontal position to a forward sloping position may  
10 have to make laborious adjustments in order to do so. This causes increased labor costs for the retailer who must allot employee hours to make the appropriate adjustments. Alternatively, the retailer may simply forego the advantage the adjustable shelf attempts to provide in order to avoid making the adjustments.

Thus there is a need for a practically designed and easy to use adjustable  
15 cantilevered shelf.

#### SUMMARY

Certain embodiments of the present invention provide an adjustable shelf unit. Each shelf is preferably rectangular. Mounting rails are located on each side  
20 of the shelf. The mounting rails comprise a top rail and a bottom rail. An upper mounting pin extends from the rear portion of the top rail and a lower mounting pin extends from the rear portion of the bottom rail. The top rail is preferably slightly longer than the bottom rail, causing the upper mounting pin and the lower mounting pin to be slightly offset.

25 According to certain embodiments of the present invention, a support frame comprises a base and two vertical members connected at the top by a horizontal member. The vertical members each have a front receiving surface containing a plurality of equally spaced apart openings. The shelves can be attached to the support frame causing the shelf to be either horizontal or forwardly sloping. In  
30 order for the shelves to be horizontal, the upper mounting pins of a shelf are first

placed in first openings of the vertical members. The lower mounting pins are then placed flush against the front receiving surface of the vertical members. The offset of the upper and lower mounting pins causes the shelf to remain in a horizontal orientation when mounted to the support frame in this manner. If it is  
5 desired for the shelf to be forward sloping, the upper mounting members are again placed in first openings and the lower mounting pins are placed in second openings located below the first openings. Again, due to the offset of the upper and lower mounting pins, the shelf is sloped forward when mounted in this manner.

10 Certain embodiments of the present invention allow retailers using cantilevered display shelves to quickly and easily adjust individual shelves in order to best display a particular product. By selectively positioning a lower mounting pins either inside an opening or flush against the surface of the vertical member, a retailer can easily adjust the orientation of the shelf to achieve the  
15 desired display effect. The design is easy to use, has minimal parts needing adjustment, and allows retailers with great flexibility when displaying product.

Thus, one embodiment of the present invention provides an adjustable cantilevered shelving unit comprising a generally planar shelf comprising a mounting rail extending from each side of the shelf, the mounting rails comprising  
20 a top rail and a bottom rail, an upper mounting pin extending downwardly from the rear edge of each top rail and a lower mounting pin extending downwardly from the rear edge of each bottom rail, the upper and lower mounting pins being offset, and a support frame comprising a base, two vertical members and a horizontal member, the vertical members each comprising a plurality of evenly  
25 spaced apart openings on a front receiving surface of the vertical members, whereby the shelf can be mountable to the display frame by inserting the upper mounting pins in first openings of the receiving surface and the lower mounting pins are selectively positionable against the front receiving surface of the vertical member causing the shelf to be oriented in a substantially horizontal orientation or

inside one second openings on the front receiving surface of the receiving structure causing the shelf to be oriented in a forward sloping orientation.

According to another embodiment, the relative positioning of the lower pin with respect to the upper pin determines the angle of forward slope of the shelf.

5 According to another embodiment, the upper mounting pin and lower mounting pin comprise a single bend. According to another embodiment, the front edge of the shelf bends upward at approximately a right angle and provides support for displayed items when the shelf can be in the forward sloping orientation. According to another embodiment, the front edge of the shelf can comprise a  
10 frame for receiving indicia. According to another embodiment, the shelf, mounting rails upper mounting pin and lower mounting pin comprise a single wire structure. According to another embodiment, the top rail can be longer than the bottom rail.

Yet another embodiment of the present invention provides an adjustable  
15 shelf assembly comprising a plurality of rectangular shelves, mounting rails extending from the side edges of each shelf, the mounting rails each comprising a top rail and a bottom rail, wherein the top rail can be longer than the bottom rail, an upper mounting pin extending from the rear portion of the top rail and a lower mounting pin extending from the rear portion of the bottom rail, the upper  
20 mounting pin and lower mounting pin extending downwardly, and a support frame comprising a base, two vertical members and a horizontal member, the vertical members each comprising a front receiving surface and a plurality of evenly spaced apart openings located on the front receiving surface, whereby the shelf can be positionable in a horizontal orientation by placing the upper mounting pins in  
25 first openings of the same height and placing the lower mounting pins against the receiving surface of the vertical members and the shelf can be positionable in a forward sloping orientation by placing the upper mounting pins in first openings of the same height and placing the lower mounting pins in second openings of the same height and located below the first openings.

According to yet another embodiment, the relative positioning of the lower pin with respect to the upper pin determines the angle of forward slope of the shelf. According to yet another embodiment, the upper mounting pin and lower mounting pin comprise a single bend. According to yet another embodiment, the front edge of the shelf bends upward at approximately a right angle and provides support for displayed items when the shelf can be in the forward sloping orientation. According to yet another embodiment, the front edge of the shelf can comprise a frame for receiving indicia. According to yet another embodiment, the shelf, mounting rails upper mounting pin and lower mounting pin comprise a single wire structure. According to yet another embodiment, the support frame can comprise wheels.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view of the adjustable cantilevered shelf.

Fig. 2 is a perspective view of the adjustable cantilevered shelf and support frame.

Fig. 3 is a broken away side view showing the adjustable shelf in horizontal and forward sloping orientation.

#### DETAILED DESCRIPTION

Certain embodiments of the present invention provide an adjustable cantilevered shelf 10. As shown in Figs. 1 and 2, the adjustable cantilevered shelf 10 comprises a top surface 30. The top surface 30 is bounded by two side edges 32 and 36, a front edge 34, and a rear edge 38. The top surface 30 is intended to receive merchandise or other items for display. According to certain embodiments of the present invention, the shelf 10 is formed from lengths of parallel spaced solid cylindrical metal rods and transverse spaced solid cylindrical rods forming a grid-like arrangement. One skilled in the art would understand that the shelf may be made from other suitable material if desired.

According to certain embodiments of the present invention, the shelf 10 comprises a pair of mounting rails 40. One mounting rail 40 extends from either side of the shelf. According to the certain embodiments of the present invention, each mounting rail is formed by a single length of wire and is part of the  
5 cylindrical metal rods forming the shelf. The single wire design allows for efficient and simple manufacturing of the mounting rail and a minimum number of adjustable parts. Each mounting rail 40 comprises a top rail 61 and a bottom rail 62. An upper mounting pin 42 and a lower mounting pin 44 extending from the rear portion of the top rail and bottom rail respectively. The upper mounting pin  
10 42 and lower mounting pin 44 preferably extend downwardly from the rear edge of the mounting rail, thereby forming a single bend. The single bend is preferably substantially a right angle according to certain embodiments of the present invention. The top rail is preferably slightly longer than the bottom rail causing the upper mounting pin and lower mounting pin to be slightly offset from one  
15 another. That is, the upper mounting pin is positioned slightly more rearwardly than the lower mounting pin. This allows the shelf to be adjustable as will be described further.

According to certain embodiments of the present invention, the front edge 34 of the shelf 10 is bent upwards at substantially a right angle. Products placed  
20 on the shelf may rest against the front edge of the shelf, particularly when the shelf is oriented at an angle. The front edge 34 is therefore configured to provide support to displayed items when the shelf is in a forward sloping position. According to certain embodiments, the front edge 34 comprises an elongated frame 33. The elongated frame 33 preferably extends the length of the front edge  
25 34 of the shelf. The elongated frame is preferably configured to receive advertising or other indicia along the front edge 34 of the shelf 10.

Certain aspects of the present invention comprise a support frame 20. The support frame is preferably generally U-shaped according to certain embodiments of the present invention. The support frame comprises a base surface 50 having an  
30 upper surface 56 and a bottom surface (not shown). Wheels 55 may preferably be



attached to the bottom surface of the base to facilitate movement of the support frame according to certain embodiments of the present invention.

5 The display frame, according to certain embodiments of the present invention, comprises two vertical members 51, 52 extending upward from each side of the base 50. The two vertical members are connected by a horizontal member 53 that extends between the top of each vertical member. Each vertical member comprises a front receiving surface 21. The front receiving surface 21 of the vertical members contain a plurality of receiving openings 72. The openings are preferably evenly spaced along the front receiving surface.

10 The shelf 10 may be attached to the support frame 20 and placed in the retail establishment to display product for sale. To secure the shelf to the display frame, each upper mounting pin 42 of the mounting rail 40 is placed inside first openings 22, 23 in the front receiving surface 21 of the display frame. The first openings are each located on one of the vertical members and are at the same vertical location. The placement of the lower mounting pin 44 with respect to the front receiving surface 21 determines the orientation of the shelf 10. If a horizontal, substantially flat orientation of the shelf 10 is desired, the lower mounting pin 44 is placed flush against the front receiving surface 21 of the receiving structure 20. The lower mounting pin therefore simply rests against the front receiving surface 21. Due to the offset of the upper mounting pins and the lower mounting pins, the lower mounting pin can rest against the front receiving surface and resist downward forces acting on the shelf when product is placed on the shelf. It should be understood that the amount of offset of the upper mounting pin and the lower mounting pin is preferably approximately equal to the thickness of the front receiving surface.

25 If it is desired to orient the shelf at a forward sloping angle, each of the lower mounting pins are placed into second openings 24, 25 in the front receiving surface 21, located below the first opening as shown in Fig. 3. The second openings are located at the same vertical location on each vertical member of the display frame.

According to certain embodiments of the present invention, the openings in the front receiving surface 21 are equally spaced along the front receiving surface such that any two receiving openings may be utilized as the first and second openings 22, 23, 24 and 25. It should also be understood that the shelf may be  
5 attached to a standard peg board and used in the same manner as described above to achieve various orientations.

The manufacturer may adjust the degree of the forward slope of the shelf by adjusting the relative position of the lower mounting pin 44 with respect to the upper mounting pin 42. Because the upper and lower mounting pins 42 and 44 are  
10 each formed by a single bend in respective ends of a single length of wire that comprises the mounting rail 40, the relative positioning of the upper mounting pin 42 and lower mounting pin 44 may be easily adjusted without additional tooling and significant changes in the manufacturing process.

What is claimed is:

1. An adjustable cantilevered shelving unit comprising:  
a generally planar shelf comprising;  
5 a mounting rail extending from each side of the shelf, the mounting rails comprising a top rail and a bottom rail;  
an upper mounting pin extending downwardly from the rear edge of each top rail and a lower mounting pin extending downwardly from the rear edge of each bottom rail, the upper and lower mounting pins being offset; and  
10 a support frame comprising a base, two vertical members and a horizontal member, the vertical members each comprising a plurality of evenly spaced apart openings on a front receiving surface of the vertical members;  
whereby the shelf is mountable to the display frame by inserting the upper mounting pins in first openings of the receiving surface and the lower mounting  
15 pins are selectively positionable against the front receiving surface of the vertical member causing the shelf to be oriented in a substantially horizontal orientation or inside one second openings on the front receiving surface of the receiving structure causing the shelf to be oriented in a forward sloping orientation.
- 20 2. The adjustable cantilevered shelf of claim 1, wherein the relative positioning of the lower pin with respect to the upper pin determines the angle of forward slope of the shelf.
3. The adjustable cantilevered shelf of claim 1, wherein the upper mounting  
25 pin and lower mounting pin comprise a single bend.
4. The adjustable cantilevered shelf of claim 1, wherein the front edge of the shelf bends upward at approximately a right angle and provides support for displayed items when the shelf is in the forward sloping orientation.  
30

5. The adjustable cantilevered shelf of claim 1, wherein the front edge of the shelf comprises a frame for receiving indicia.
6. The adjustable cantilevered shelf of claim 1, wherein the shelf, mounting rails upper mounting pin and lower mounting pin comprise a single wire structure.
7. The adjustable cantilevered shelf of claim 1, wherein the top rail is longer than the bottom rail.
8. An adjustable shelf assembly comprising:  
a plurality of rectangular shelves;  
mounting rails extending from the side edges of each shelf, the mounting rails each comprising a top rail and a bottom rail, wherein the top rail is longer than the bottom rail;  
an upper mounting pin extending from the rear portion of the top rail and a lower mounting pin extending from the rear portion of the bottom rail, the upper mounting pin and lower mounting pin extending downwardly; and  
a support frame comprising a base, two vertical members and a horizontal member, the vertical members each comprising a front receiving surface and a plurality of evenly spaced apart openings located on the front receiving surface;  
whereby the shelf is positionable in a horizontal orientation by placing the upper mounting pins in first openings of the same height and placing the lower mounting pins against the receiving surface of the vertical members and the shelf is positionable in a forward sloping orientation by placing the upper mounting pins in first openings of the same height and placing the lower mounting pins in second openings of the same height and located below the first openings.
9. The adjustable shelf assembly of claim 8, wherein the relative positioning of the lower pin with respect to the upper pin determines the angle of forward slope of the shelf.

10. The adjustable shelf assembly of claim 8, wherein the upper mounting pin and lower mounting pin comprise a single bend.
- 5 11. The adjustable shelf assembly of claim 8, wherein the front edge of the shelf bends upward at approximately a right angle and provides support for displayed items when the shelf is in the forward sloping orientation.
12. The adjustable shelf assembly of claim 8, wherein the front edge of the  
10 shelf comprises a frame for receiving indicia.
13. The adjustable shelf assembly of claim 8, wherein the shelf, mounting rails upper mounting pin and lower mounting pin comprise a single wire structure.
- 15 14. The adjustable shelf assembly of claim 8, wherein the support frame comprises wheels.

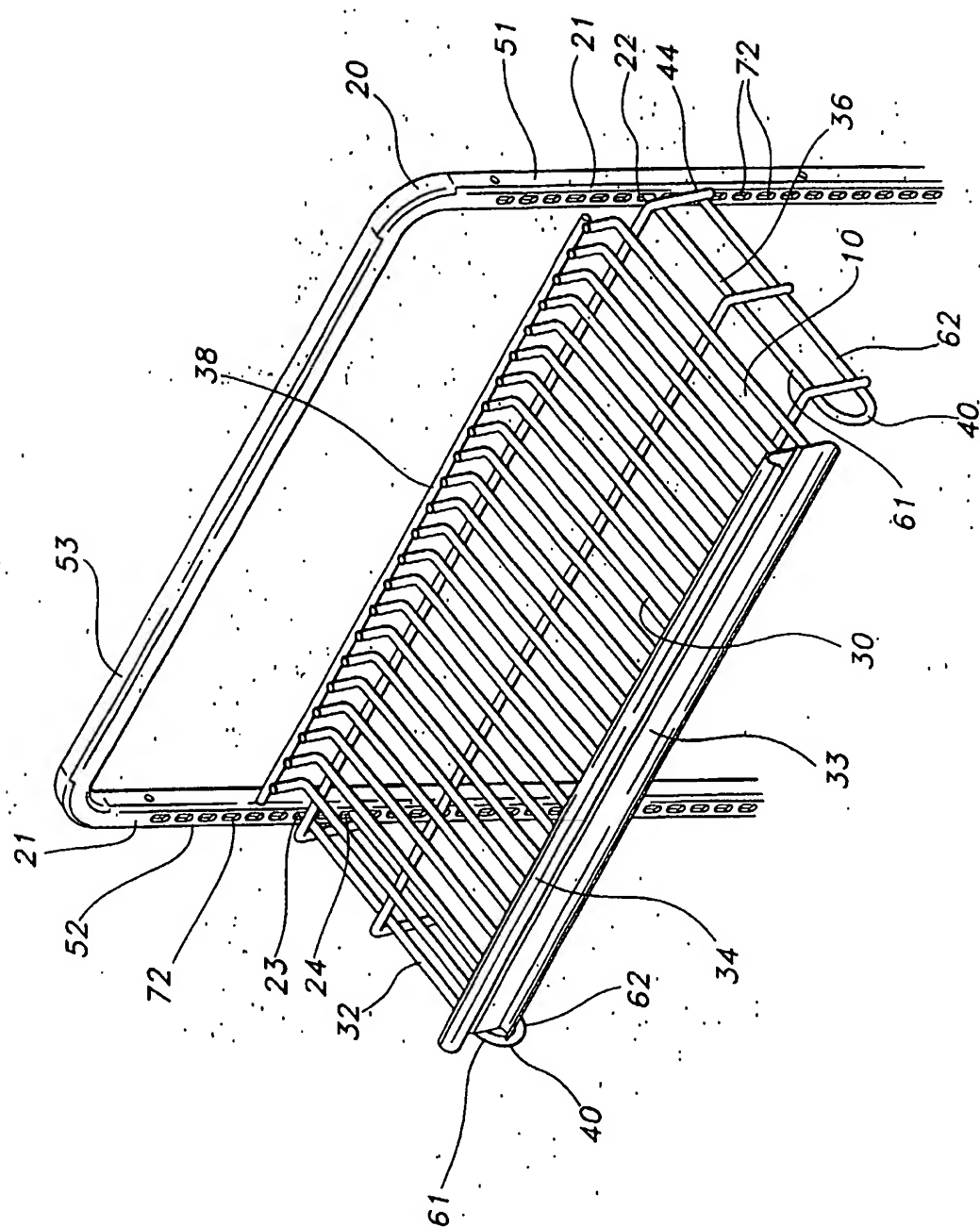


FIG. 1

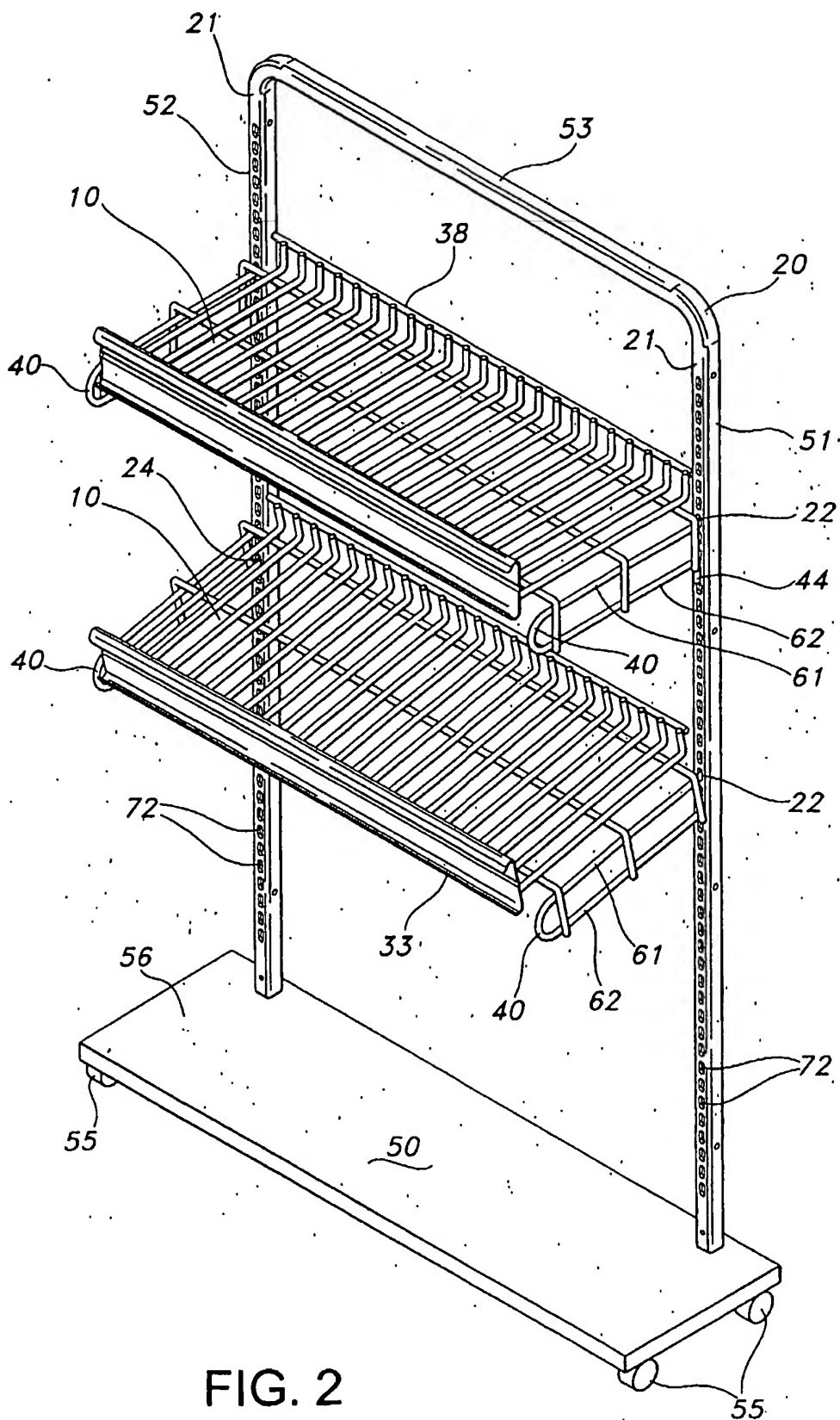


FIG. 2

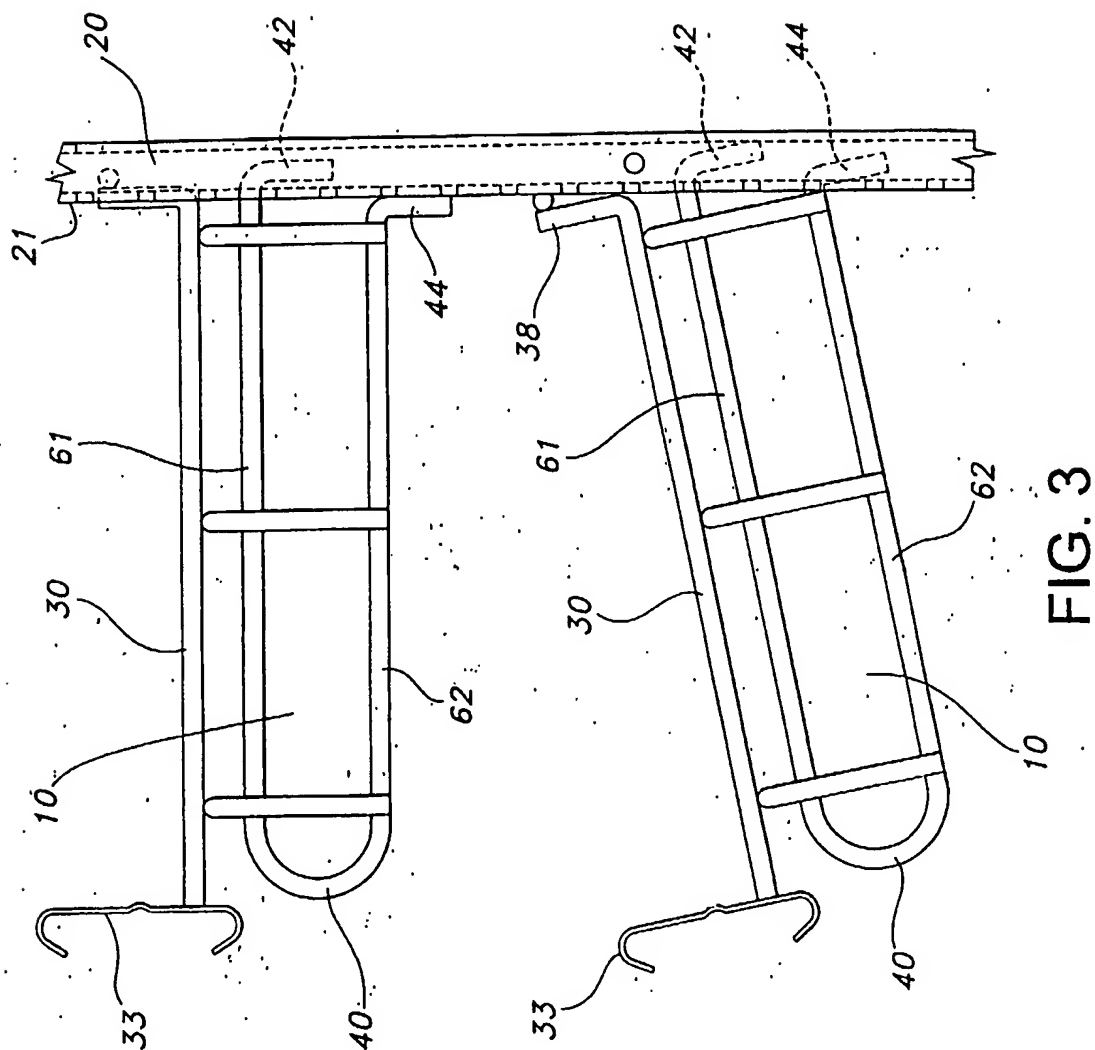


FIG. 3



# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/US2004/036098

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 A47F5/12

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A47F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	FR 2 548 529 A (BURDIN JACQUES) 11 January 1985 (1985-01-11) the whole document	1-14
A	WO 90/02500 A (SINTEK INTERNATIONAL AB) 22 March 1990 (1990-03-22) the whole document	1-14
A	US 2002/027115 A1 (GAY KENNETH F ET AL) 7 March 2002 (2002-03-07) the whole document	1-14
A	US 6 070 841 A (ROBINSON ET AL) 6 June 2000 (2000-06-06) the whole document	1-14
	----- -/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

\* Special categories of cited documents:

\*A\* document defining the general state of the art which is not considered to be of particular relevance

\*E\* earlier document but published on or after the international filing date

\*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

\*O\* document referring to an oral disclosure, use, exhibition or other means

\*P\* document published prior to the international filing date but later than the priority date claimed

\*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

\*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

\*&\* document member of the same patent family

Date of the actual completion of the international search

9 February 2005

Date of mailing of the international search report

01/03/2005

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Cardan, C

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/US2004/036098

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 3 795 379 A (GRAY J,US) 5 March 1974 (1974-03-05) the whole document -----	1-14
A	EP 0 442 398 A (LINDE AKTIENGESELLSCHAFT) 21 August 1991 (1991-08-21) the whole document -----	1-14

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US2004/036098

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
FR 2548529	A	11-01-1985	FR 2548529 A1	11-01-1985
WO 9002500	A	22-03-1990	SE 469869 B AT 116118 T AU 4184389 A CA 1312046 C DE 68920331 D1 DE 68920331 T2 EP 0451148 A1 PT 91593 A ,B SE 8803077 A WO 9002500 A1	04-10-1993 15-01-1995 02-04-1990 29-12-1992 09-02-1995 03-08-1995 16-10-1991 30-03-1990 03-03-1990 22-03-1990
US 2002027115	A1	07-03-2002	US 6302282 B1	16-10-2001
US 6070841	A	06-06-2000	NONE	
US 3795379	A	05-03-1974	NONE	
EP 0442398	A	21-08-1991	DE 4004278 A1 EP 0442398 A1	14-08-1991 21-08-1991